

## Supporting Information

### **A basic protein, N25, from a mollusk modifies calcium carbonate morphology and shell biomineralization**

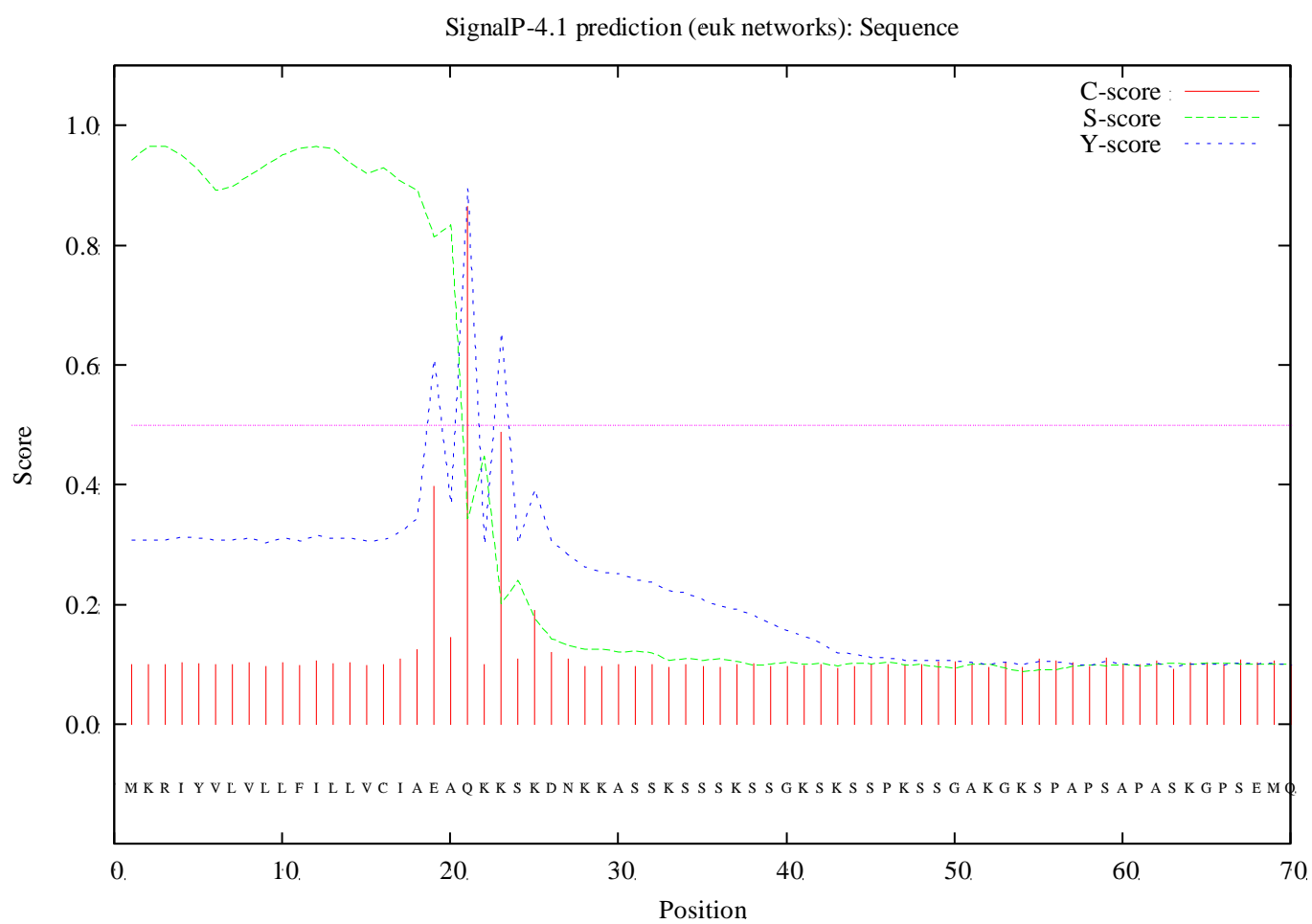
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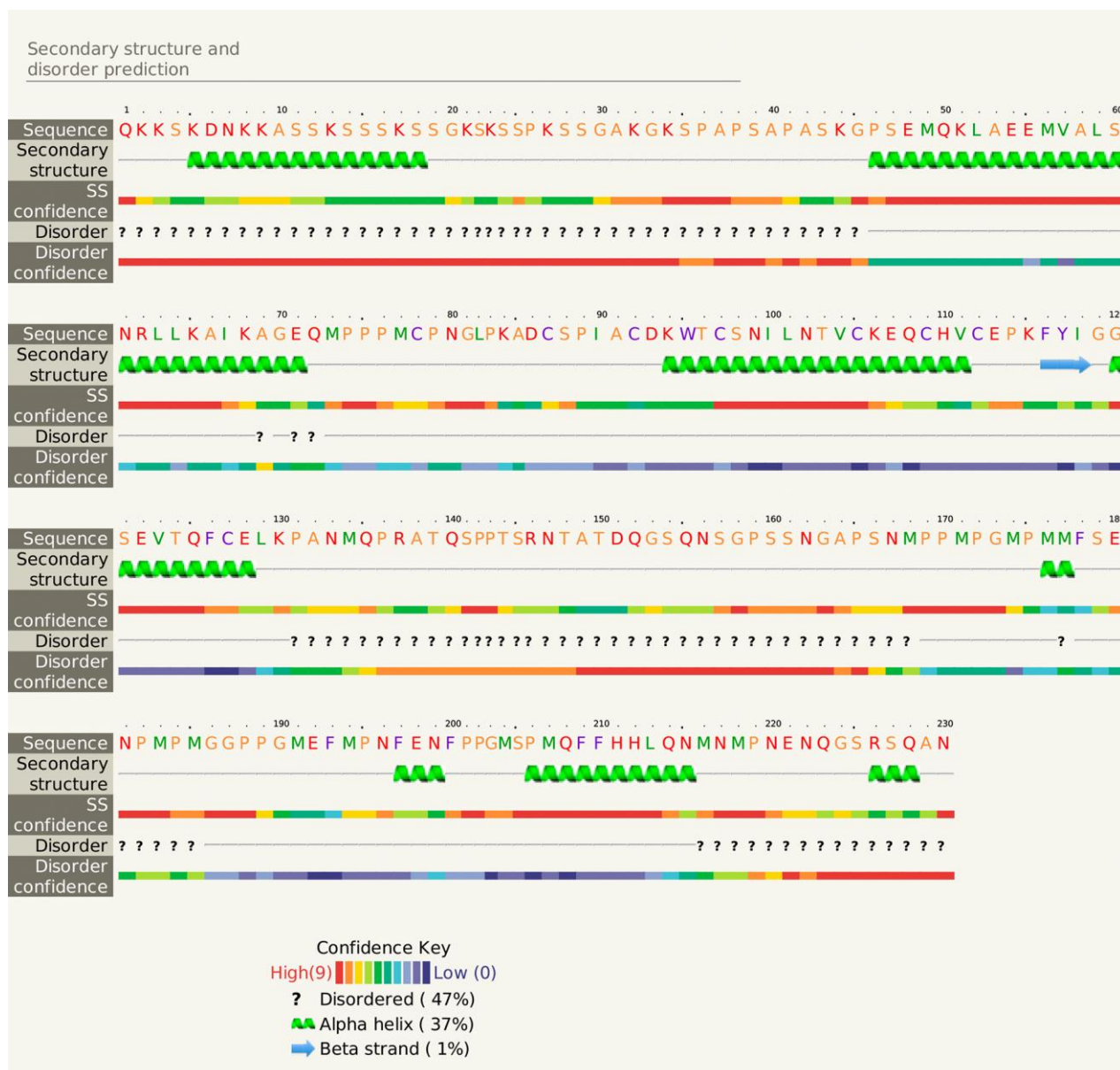
2, Department of Biotechnology and Biomedicine, Yangtze Delta Region Institute of Tsinghua University, Jiaxing, Zhejiang Province 314006, China

Running title: Functions of N25 on CaCO<sub>3</sub> morphology

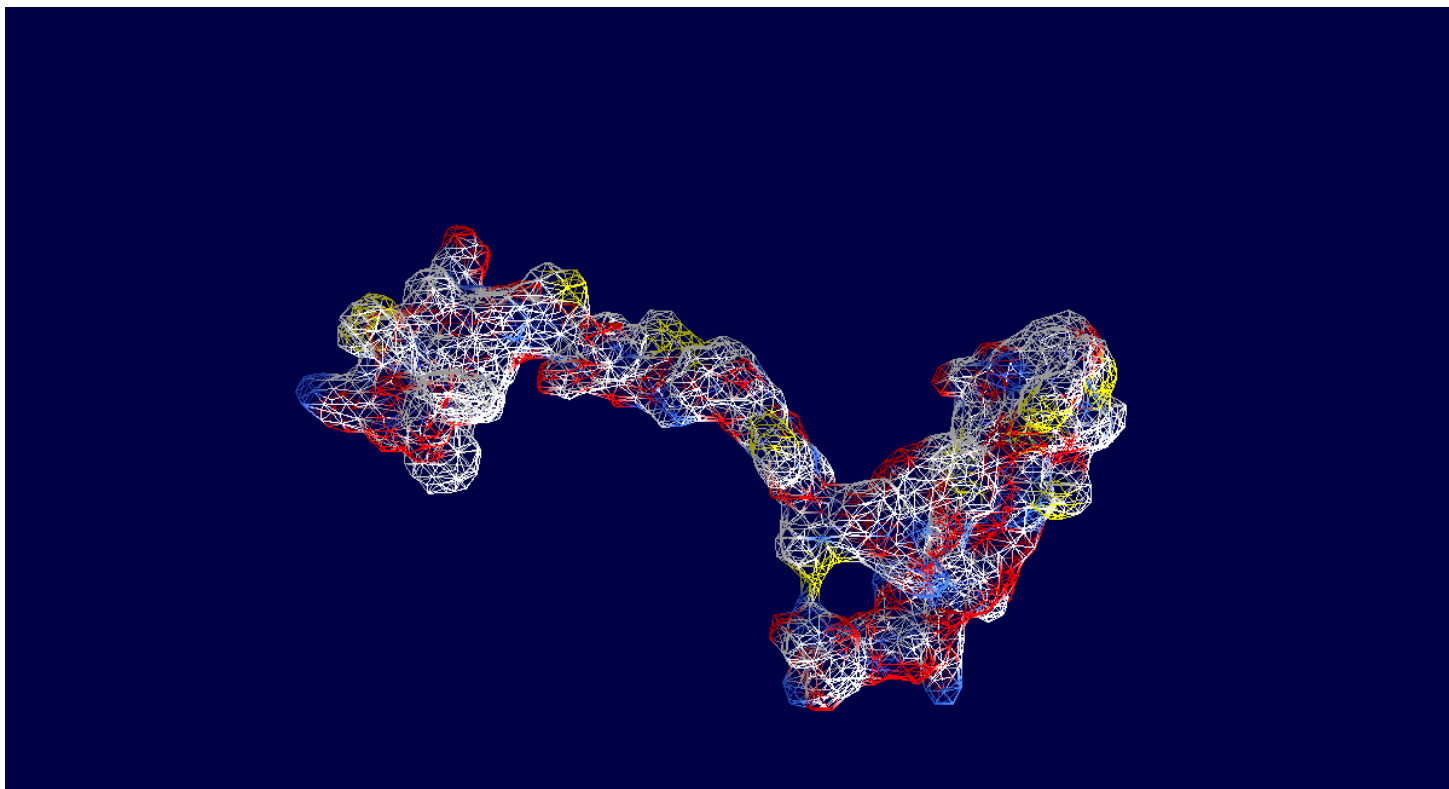
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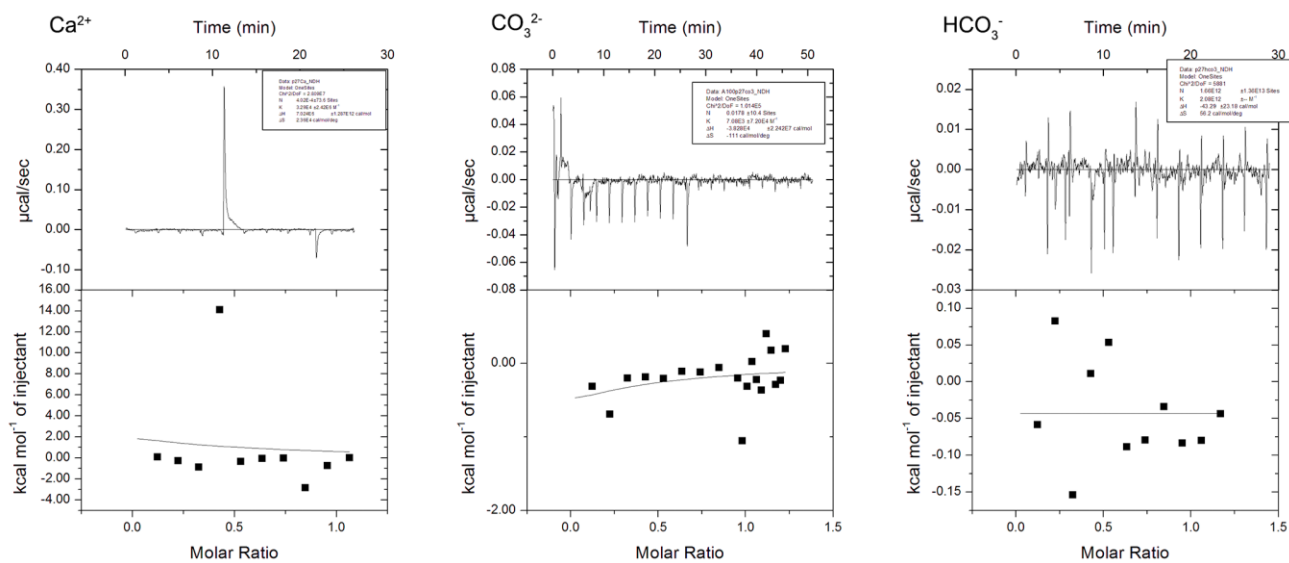
**Figure S1.** The signal peptide prediction with the cleavage site at EA-QKK.



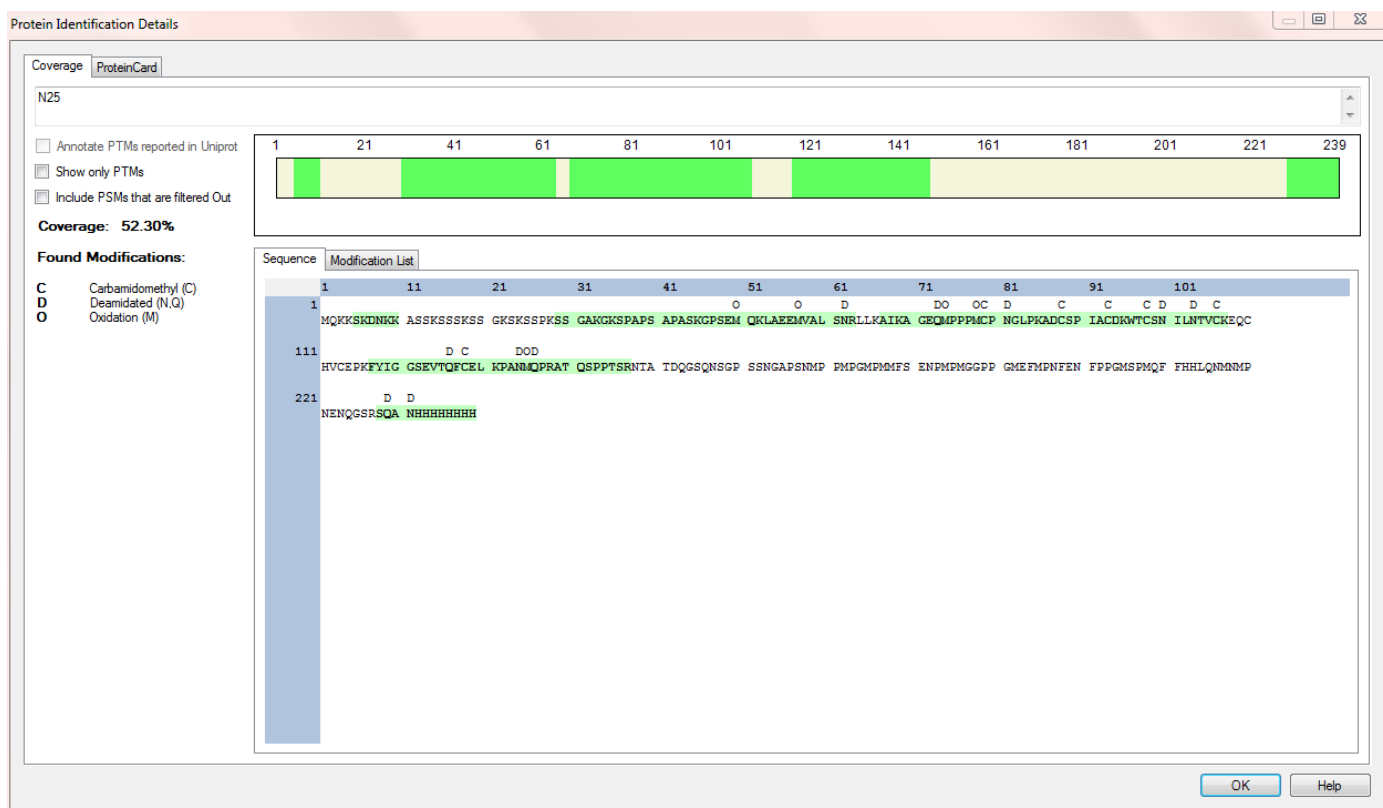
**Figure S2.** The secondary structure prediction from the primary sequence. The graphic symbols were illustrated as shown in picture. (<http://www.sbg.bio.ic.ac.uk/phyre2/html/page.cgi?id=index>)



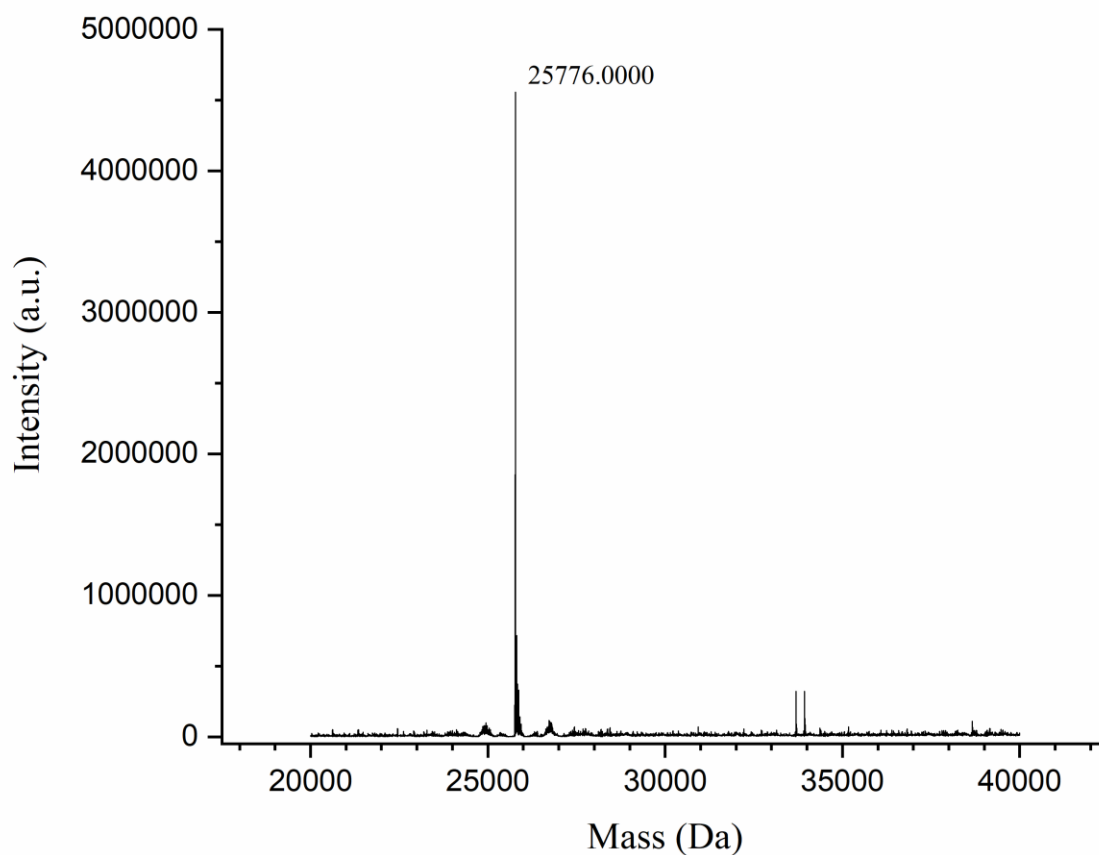
**Figure S3.** The tertiary structure prediction of N25 via primary sequence.  
(<http://www.sbg.bio.ic.ac.uk/phyre2/html/page.cgi?id=index>)



**Figure S4.** Isothermal Titration Calorimetry (ITC) results of N25 titrated with  $\text{CaCl}_2$ ,  $\text{Na}_2\text{CO}_3$  or  $\text{NaHCO}_3$  respectively. The concentration of N25 was about 1.0 mg/mL, the concentrations of  $\text{Ca}^{2+}$ ,  $\text{CO}_3^{2-}$  and  $\text{HCO}_3^-$  were about 50  $\mu\text{M}$ .



**Figure S5.** N25 protein identification by mass spectrometry and sequence coverage of the band in **Figure 1A**.



**Figure S6.** Analysis of N25 protein molecule weight by QTOF-MS.

**Table S1.** The post-translational modifications analysis of N25 by MS

-10lgP	Coverage	Area Sample 1	#Peptides	#Unique	#Spec Sample 1	PTM	Avg. Mass
461.66	95%	1.98E+11	237	237	5033	Oxidation (M); Carbamidomethylation; Acetylation (K); Acetylation (N-term); Amidation; 206 more	25652